

tered and localized stasis very difficult to explain. There was generalized lymphostatic edema of all the four limbs; the colon was edematous, but not the small gut; nor was there more than a very little free fluid in the belly, and very little, too, in the pleurae. This peculiar localization cannot be accounted for by a block of the great veins at the heart or in the mediastinum. So that the theory of a venous stasis is also insufficient to explain every case.

The cause of this patient's lymphatic block remains a puzzle, but, whatever the cause may be, lymphatic obstruction may have something to do with the production of the periosteal deposits and the clubbing of the fingers and toes.

Douglas Campbell, in the *British Medical Journal* for January 24, 1924, illustrated sections of club-fingers in a case of osteoarthropathy following cancer of the lung. They showed nothing but edema without osseous changes; the long bones, however, were covered with typical periosteal deposits. Periosteal deposits similar to those of osteoarthropathy are also common in elephantastic limbs. Campbell considers lymphatic obstruction as the etiological factor underlying secondary osteoarthropathy. He attributes the edema to imperfect oxygenation, whatever the cause of this imperfection may be, and thus explains the clubbing described after disease of the liver and other extrathoracic organs, which may also lead to imperfect oxygenation.

It seems to me that the theory of a lymphostatic origin—possibly an infectious one—has more to offer in many ways than the theories of "toxemia" and venous stasis which have hitherto been advanced.

Dr. Bryan's case is of uncommon interest and adds strength to this theory of Campbell's.

W. R. P. CLARK, M. D. (516 Sutter Street, San Francisco)—This case of secondary hypertrophic osteoarthropathy following metabolic sarcoma of the lung, reported by Doctor Lloyd Bryan and discussed by Doctor Leo Eloesser, has been of unusual interest to me from several points of view:

1. On account of the question of the etiology of osteoarthropathy, and this point has been well considered by Bryan and Eloesser.

2. On account of the rapidity of the appearance of osteoarthropathy. I think many of us have been inclined to think of this condition as being of slow development and when present, in tuberculosis or heart disease, as indicating a primary disease of long duration, whereas in tuberculosis it is often a matter of months rather than of years.

3. On account of the malignancy of the lung. So many cases of malignancy of the lung, either primary or metastatic, have come to my notice during the past two or three years, that I have been impressed with the fact that one should keep constantly in mind this condition when making a differential diagnosis of chest pathology.

4. And, lastly, on account of the failure of x-ray therapy. All of us have hoped that, with the advent of deep x-ray therapy, a cure for malignancy might have been found, but this is one more case that has failed to respond. I do not wish to be misunderstood, however; x-ray therapy, I believe, still has its place in the treatment of malignancy of the lung, for, even if the progress of the disease may not be prevented, oftentimes some of the symptoms may be greatly ameliorated.

Training the Mind to Rest—Some men, when not working at routine, will close their minds like books. Like steamship captains they will signal "Finished with the engines" and let a dynamo become inert. For them there are no Elysian fields of intellectual pastime, no exaltation in thought of knowledge gained or service rendered. They work and they cease working; there is no eager turning to new fields to browse in. They do not think while smoking; they simply smoke, like cloud-compelling Jupiters, as Dean Briggs has characterized one class of undergraduates. Such of us may dream, but we do not wake and carry out our dreams.—*The Boston Medical and Surgical Journal*, Editorial.

SPINAL ANESTHESIA IN UROLOGY

By J. C. NEGLEY, M. D., Los Angeles

Reports over five thousand patients without a death. Success means careful attention to all details.

IMPORTANT DISCUSSIONS by R. L. Rigdon, San Francisco; Miley B. Wesson, San Francisco; Arthur B. Cecil, Los Angeles; Granville MacGowan, Los Angeles.

IN PRESENTING this paper, I wish to tabulate our experiences, impressions and conclusions regarding spinal anesthesia at the Los Angeles General Hospital. It was introduced at this institution over twenty years ago by Dr. Granville MacGowan, and since that time it has been used in approximately 5500 cases for either operation or cystoscopic examination in difficult cases. Doctor MacGowan first used cocain, grain $\frac{1}{4}$, dissolved in 2 cc. of water. This method proved unsatisfactory, in that syncope and respiratory difficulty were frequent, and this drug had to be abandoned. Stovain was next tried and this drug also proved to be dangerous. Two cases in which stovain was used, Doctor MacGowan reports a localized necrosis of the external surface of the calf of the legs and heels, limited to the skin and down to but not through the deep fascia. This necrosis seemed to follow the distribution of the peroneal nerves. Finally, he began the use of tropacocain, which he has found most satisfactory and which he still uses. During the last six years novocain in 1 or 2 grain doses has been the drug most commonly used at this institution. Either drug may be dissolved in sterile distilled water or in the spinal fluid itself. There is very little difference in the toxicity of novocain and tropacocain.

TECHNIC OF ADMINISTRATION

The drug to be used is placed in a small glass vial of 1 or 2 cc. capacity and sterilized dry at a temperature of 90 to 100 C. for one hour. The already prepared ampules of the dry drug put out by the drug firms answer the purpose just as well, but are too expensive in large amounts. Using a 5 or 10 cc. Luer, with a 24 gauge needle loaded with one-half per cent novocain, a wheel is made over the third or fourth lumbar interspace directly in the center. The small needle is then removed from the Luer, and one two inches long, gauge 21 or 22, is substituted. With this, one can infiltrate the fascia and muscles clear down to the dura, after which the puncture itself will be practically painless. A Quincke needle of about 22 gauge is then used for the puncture. The dry crystals may be dissolved in the spinal fluid, if preferred, or may have been previously dissolved in sterile distilled water. This seems to be a matter of no importance. About 10 cc. of the spinal fluid is drawn up into the syringe and reinjected, repeating this procedure (four or more times) so that proper diffusion of the drug in the subdural space will be accomplished. In such a large teaching institution, where the administration of the anesthetics must be co-operated in by a number of individuals, the anesthesia is often insufficient to perform supra-pubic operations painlessly, perhaps in about 20 per cent of the cases. However, in those cases where the procedure is in the hands of one person thoroughly trained and skilled in its use, the percentage of failures of complete anesthe-

sia falls to 4 per cent, or even less. In the event of partial anesthesia, a surprisingly small amount of ether or nitrous oxide will complete the anesthesia. Absorption of the drug is rapid, and if the anesthesia is going to be successful, one can begin the operation in five or six minutes, and probably more than 90 per cent of the drug is absorbed in ten minutes. After ten or fifteen minutes, the patient can be put in the Trendelenburg position with safety. In fact, like the toxic effects of general anesthesia, the patient will respond much better in this position than in a recumbent one.

The most marked and noticeable effects of spinal anesthesia is the rapid drop in blood pressure and a change in type of respiration due to anemia of the brain and the reflex started in the solar plexus. The pulse beat becomes feeble and slower, and almost imperceptible at times. These effects are terrifying, but the real adjustment of both respiration and circulation is almost as rapid as their onset. The patient is apt to have nausea and vomiting at this time, which is not prolonged for any great length of time.

SELECTION OF CASES FOR THIS FORM OF ANESTHESIA

It is particularly useful in the operation of suprapubic prostatectomy where we have feeble old men with chronic bronchitis and emphysema, damaged kidneys, and a heart that is susceptible to strain. Following operation, there is often no nausea or vomiting, and when there is gastric distress it usually subsides much more quickly than that from a general anesthetic. This is a great advantage, since most of these patients need an abundance of fluids, and also lessens the danger of hernia from an operation in which a necessarily large hiatus in the aponeurosis of the rectus muscle is left. (At this institution, the greatest number of patients who receive spinal anesthesia occur in the rectal clinic. Here anesthesia is nearly always successful, whereas it doesn't always reach the suprapubic region.) Hemorrhage may occasionally follow prostatectomy with this anesthetic, if one is not careful to use a Pilcher bag, or pack the bladder. There may seem to be no hemorrhage when the operation is completed, but as the blood pressure returns to normal, bleeding may set in. Headaches follow spinal anesthesia in a smaller percentage of cases than from simple lumbar puncture for this reason: In most of the cases operated upon the patient is kept in a recumbent position for at least many days, and when a simple lumbar puncture is done he is apt to be up and about after the first or second day. Practically, the only cases that have severe headaches are for very minor surgical procedures or examinations where the patient is allowed to get up or sit up at a very early date following the operation.

DISADVANTAGES

It is not a method to be used with satisfaction by anyone not thoroughly familiar with the technique, even to the slightest detail. Such a rapid and marked fall of blood pressure acts as a profound shock to some of these old men with greatly lowered resistance. Patients who are neurotic sometimes become so restless and move about so much as to interfere materially with the operation. The head-

aches that sometimes follow are a detriment, in that they retard convalescence from the distress and lack of sleep.

Once given, the anesthetic cannot be stopped except by reinsertion of the needle and withdrawal of spinal fluid, which is a dangerous and awkward procedure in a patient with shock.

It cannot be given in graduated amounts to suit the different stages of the operation as can a general anesthetic. In cases that do not get anesthesia, the operation must be postponed or a general anesthetic given, which is not always possible.

Spinal anesthesia in this series of cases seems to have been the best possible anesthetic and, in that type of cases before mentioned, is far superior to the general anesthetics. Time alone will tell whether it will be supplanted by sacral, parasacral, and other methods of regional anesthesia.

219 West Seventh Street.

DISCUSSION

R. L. RIGDON, M. D. (291 Geary street, San Francisco)—It has seemed best to make this discussion in the first person, rather than to review the experience of others. These records are open and can be read as well, or better, in other reports than mine, and each surgeon can formulate his own conclusions.

Many years ago I began the employment of intradural injections, and for a time I was very enthusiastic over my results. Then disaster came my way, and a patient died on the table. Reluctantly I took up general anesthesia. After a number of years, such glowing reports were made from clinics that had continued the use of spinal anesthesia that I found myself once more impelled to resume that method. This was during the war. Again I was delighted, but having lost one patient before I was rather apprehensive; in fact, I was a bit "gun shy," as it were, and when I was operating and I would notice the patient's face taking on an ashy hue, I would become very much alarmed and would pass a very uncomfortable fifteen or twenty minutes, wondering if the patient would ever come back. In the meantime, the administration of gas and oxygen as an anesthetic had become so satisfactory in skillful hands, that I felt myself almost compelled to use that method. For a number of years this has been the only anesthetic I have used, except now and then ether. The patients do very well, but of course there are occasional symptoms of nausea, vomiting, general malaise, and perhaps a tendency to free bleeding. Now comes this report which shows a remarkable record of successes and no fatalities.

Perhaps I may once more revert to the spinal needle and novocain. If so, I hope I may be able to control my disposition to sweat, when the symptoms of collapse come.

MILEY B. WESSON, M. D. (Flood Building, San Francisco)—In this very interesting and concise paper the author has clearly brought out that the success and safety of spinal anesthesia is the user rather than the method; if it is dangerous it is because it is used without full understanding or recourse to necessary antidotal safeguards; if it is ineffective, the technique has not been acquired; and if there are frequent post-operative complications, it is because something has been done that should not have been done.

Intra- and extra-dural nerve blocking are new procedures, spinal anesthesia having been introduced by Bier in 1904 and sacral anaesthesia by Stoeckel in 1909, consequently reports are meager. Statistics are worthless unless there is a large volume to deal with. Bromfield, in a recent study of 2,171,461 anesthesia administrations, found the mortality from ether to be 1 in 8010, and in spinal analgesia 1 in 515. Babcock, in a series of 15,000 spinal inductions, found a mortality of 1 in 10,000 in selected cases, and 1 in 500 in unselected; while Steel had 3 deaths in 5000 cases in a period of fourteen years, none occurring during the last five years. In analyzing statistics, one is impressed with the facts that the unto-

ward effects occur during the first years of use and before the operator has acquired his technique.

In 1912, following an epidemic of cerebrospinal meningitis, I published a series of 800 uncomplicated lumbar punctures, and I found at that time that the use of serum by the incompetent caused about the same complications as Dr. Negley has noted.

We have all been trained with the idea that little skill is required to give an anesthetic, so such duties fall to the junior intern or the nurse. When such an assistant is given a Quincke needle and a book of instructions, someone's series of a hundred cases or less is going to show complications ranging from paralysis to exitus. Since the reports of complications in the literature generally come from such small series of cases, the question naturally arises whether the method is at fault or personal incompetence should be blamed. Sacral anesthesia has proven very satisfactory at the Mayo Clinic, because Labat was brought from Pauchet's Clinic in Paris to teach its use. Intra- and extradural nerve-blocking is a delicate procedure, requiring more skill than the suprapubic removal of a prostate, and the anesthetist should not only be a surgeon, but have an intimate and an exact knowledge of physiology and pharmacology.

Any operation whose technique cannot be quickly mastered by the average surgeon should not be used by any but trained specialists. Spinal anesthesia administered by experts to properly selected cases is efficient and harmless, but in the hands of amateurs is still pregnant with dangerous possibilities, hence I do not feel that its general use should as yet be encouraged.

ARTHUR B. CECIL, M. D. (Pacific Mutual Building, Los Angeles)—It gives me great pleasure to discuss Dr. Negley's article on spinal anesthesia in urology. He has made a contribution which is notable not only for giving exact methods of technique, but for his unbiased discussion of a subject with which he is thoroughly familiar. There are undoubtedly cases in urology where general anesthesia is to be avoided, and I take it that Dr. Negley would more or less limit the use of spinal anesthesia to these instances.

Personally, I do not believe that as a routine spinal anesthesia will ever replace general anesthesia. I believe that, all in all, it is more dangerous; that one would have more accidents than would be the case where general anesthesia was properly administered. Unconsciousness of itself should never be a deciding factor. I am not at all sure that the state of unconsciousness of one's patient does not many times result in a better surgical procedure than one could carry out were the patient conscious.

So far as I have been able to determine, unless there were definite indications for local or spinal anesthesia, I would much prefer to have the urological case under a general anesthetic properly administered; and yet in making this choice I realize that very few people have the ability to carry out spinal anesthesia with the degree of success of which Dr. Negley is capable.

GRANVILLE MACGOWAN, M. D. (Brack Shops Building, Los Angeles)—In examining the discussions of Dr. Negley's paper by Drs. Rigdon, Wesson, and Cecil, I am reminded of the Asiatic proverb that "Most of the evils we fear never happen." All the dangers which are conjured up by suspicious and timid souls, as applying to spinal anesthesia were thought of by me and resulted in my most bitter opposition to this method of producing analgesia during the first year after the method had been proposed and its possibility demonstrated. An accidental circumstance led me to overcome my prejudice and use it in a case where any method of anesthesia involved more danger than the operation itself. The agent at this time was cocaine, and it was with much fear that I used it. The results were so satisfactory and so astounding to me that, with great caution, I occasionally used spinal anesthesia for perhaps a year. Although no fatalities occurred in my practice, there were sufficient that arose throughout the world to make its dangers seem very real. Then tropococaine with a toxicity enormously less than cocaine was discovered and introduced for use in spinal anesthesia. I became one of its users, and it has been my favorite method of obtaining anesthesia in my cases of genito-urinary surgery in which the circulatory or respiratory condition was unfavorable for the use of a general anesthetic, or when there existed a morbid fear of being rendered unconscious, or when it was desirable that the person on

whom the operation was being performed should have the muscles of the lower abdomen and of the perineum entirely relaxed during the period of operation. I have never had any fatality, nor any serious trouble arising from this anesthetic. During the same period of time, where from reasons of prejudice, or as during the war when tropo-cocaine was for a time unobtainable, a general anesthesia—gas oxygen or ether—had to be administered, I have often experienced very real difficulty and much trouble and interruption of the operation to restore or revive the patient.

I do not believe that routine spinal anesthesia will ever replace general anesthesia, not because it is more dangerous, but because it seems to require a considerable amount of mechanical skill and judgment that the average surgeon does not possess and will not learn.

By using a small and delicate needle for the spinal puncture, there is, in my opinion, no chance for any mechanical injury to the cord if the surgeon does not possess the idea that the only way of obtaining access to the subarachnoid space is by means of rape of the spinal column. In performing lumbar puncture, either for diagnosis or for anesthesia, I teach the humane method of anesthetizing the skin and the deeper tissues down to the dura with a half per cent solution of novocaine before inserting the spinal needle.

The headache which one occasionally sees follow spinal anesthesia is not due to the drug, because it very frequently follows a simple spinal puncture where the individual is allowed to be up and about too soon. The fact that the nature of the operations upon the uro-genital organs in which I use spinal anesthesia requires a long sojourn in bed is usually sufficient prophylaxis against these headaches. It is never necessary to have the patient out of bed early. The trail of stinking urine marking their progress is, to my mind, an evidence of cruelty and indifference to comfort upon the part of the operator.

There is another point upon which I wish to dwell, which is, that the relaxation obtained by spinal anesthesia avoids the necessity for the extremely rapid operative procedures which are regarded by so many as absolutely necessary in genito-urinary surgical work, a rather nefarious belief, founded entirely upon the evil effects which are known to result from a prolonged anesthetic. Under a spinal anesthetic, plenty of time can be taken for deliberative movements and completion of the operation, which should be finished when once commenced.

Individually, I have been very glad that such an agent existed, not only on account of the many cases of bad risks which I have been able to conduct to a favorable conclusion, but also on my own account, because for many years I have been obliged to operate with one arm, the subject of a traumatic neuritis which never has been during the whole period without pain, and the muscular relaxation of the patient has saved me from struggling with him, as so commonly happens in supra-pubic manipulations inside of the bladder and in perineal operations where the patient does not lie quiet under a general anesthesia conducted by timorous or unskillful anaesthetists.

DOCTOR NEGLEY (closing)—Doctor MacGowan, in his masterful discussion of this paper, has left very little for me to say, as he has answered both Dr. Rigdon and Dr. Cecil in their attitude toward this method of anesthesia.

Dr. Wesson's concluding remarks regarding the use of spinal anesthesia cover my attitude exactly, except that I think surgeons in general, and urologists in particular, should learn the technique absolutely and use it more frequently.

Mails Closed to "Cures"—The Postoffice Department has issued "fraud orders" against two alleged tuberculosis cures recently, and they are getting quite busy with certain other classes of "fakirs" who use the mails to exploit the sick. One of the tuberculosis "cures" fooled a lot of newspapers by sending out their "news" stories as quotations from Dr. X, quoted as "a prominent doctor of —." The doctor referred to proved to be an osteopath. "Doctor — of California," said by the newspaper stories to be a "national authority" on tuberculosis, was given front-page prominence for another "cure" for tuberculosis. Investigation showed that no such doctor lived in California.